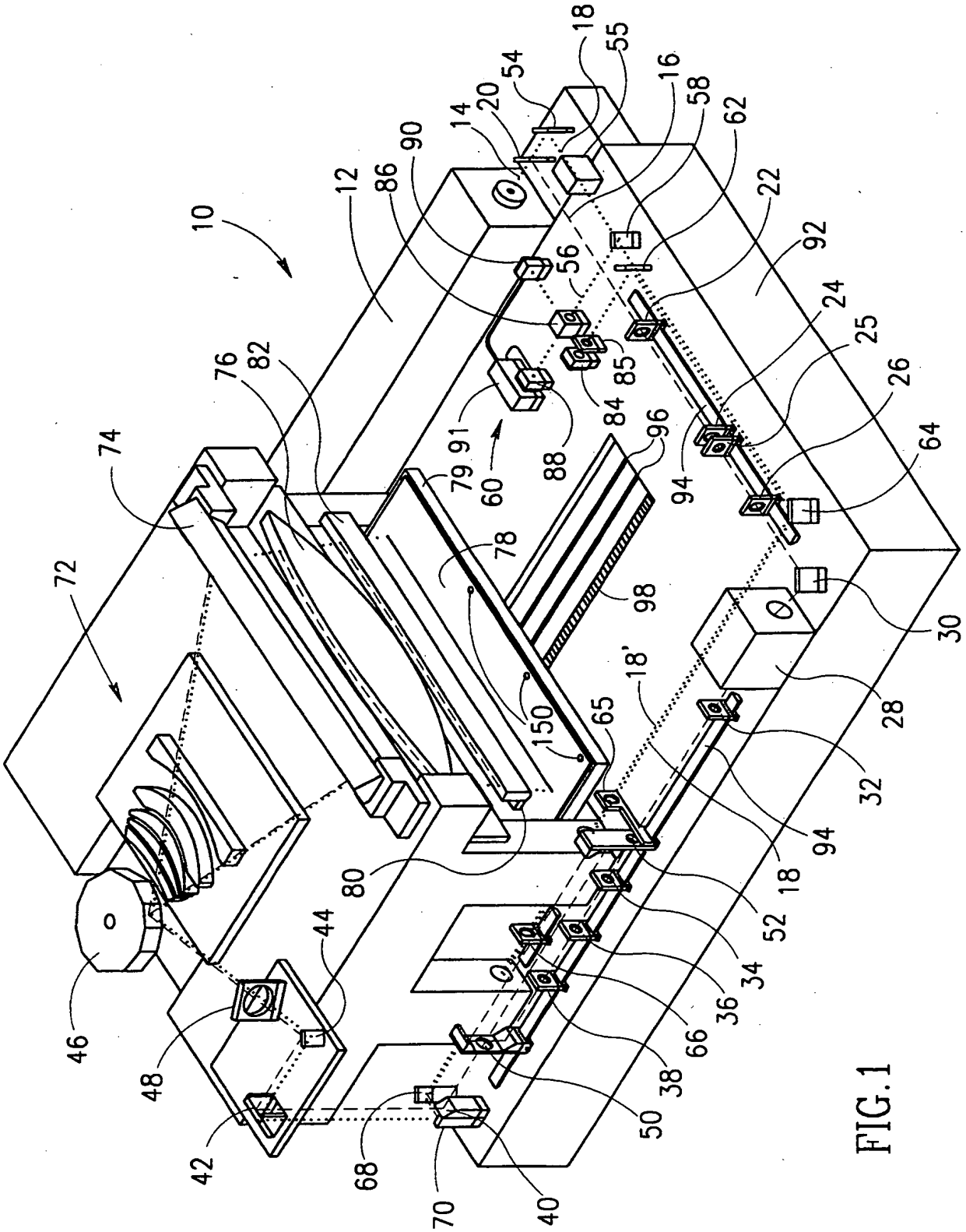
10
12
14
16
18
18'
20
22
24
25
26
28
30
32
34
36
38
40
42
44
46
48
50
52
54
55
56
58
60
62
64
65
66
68
70
72
74
76
78
79
80
82
84
85
86
88
90
91
92
94
96
98
150

FIG.1

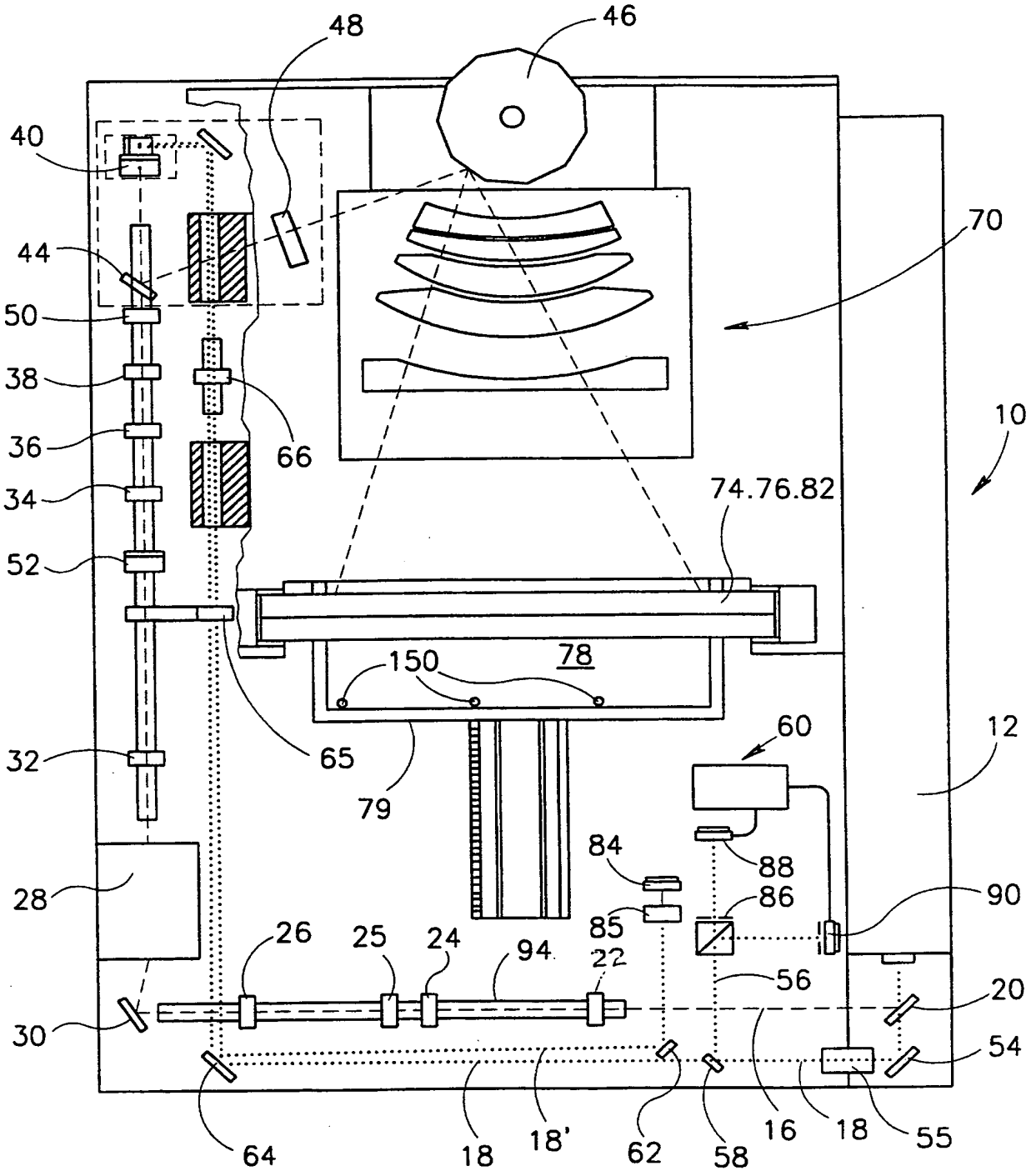
48
46
40
70
44
50
38
66
36
10
34
74.76.82
52
150
78
65
79
60
12
32
84
88
28
86
90
85
26
25
24
94
22
56
20
30
54
64
18
18'
62
58
16
18
55

FIG.2

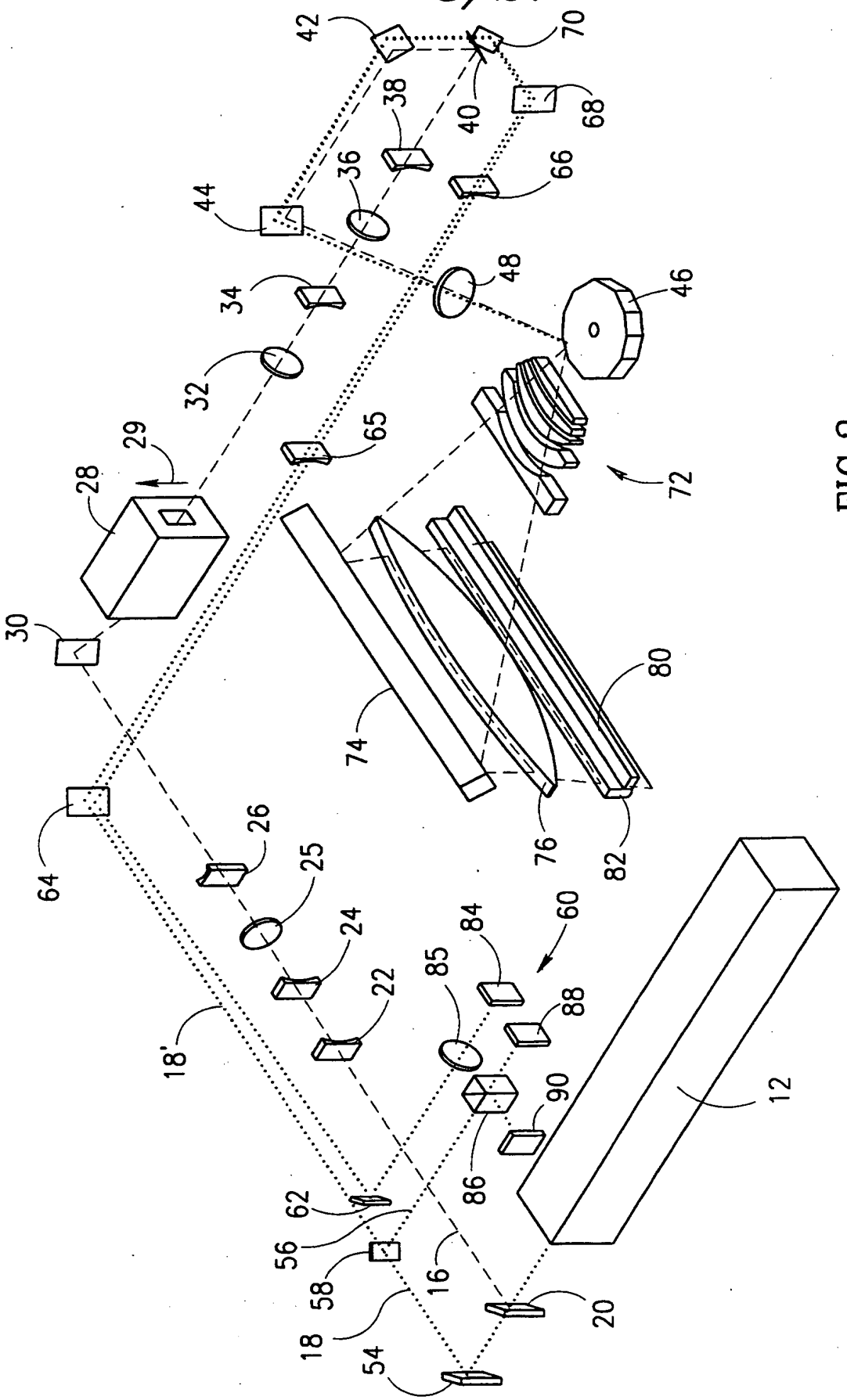
42
70
38
40
68
36
66
44
48
46
34
32
65
29
28
72
30
74
80
64
26
25
76
82
24
60
84
85
22
88
18'
90
12
86
62
56
16
58
20
18
54

FIG.3

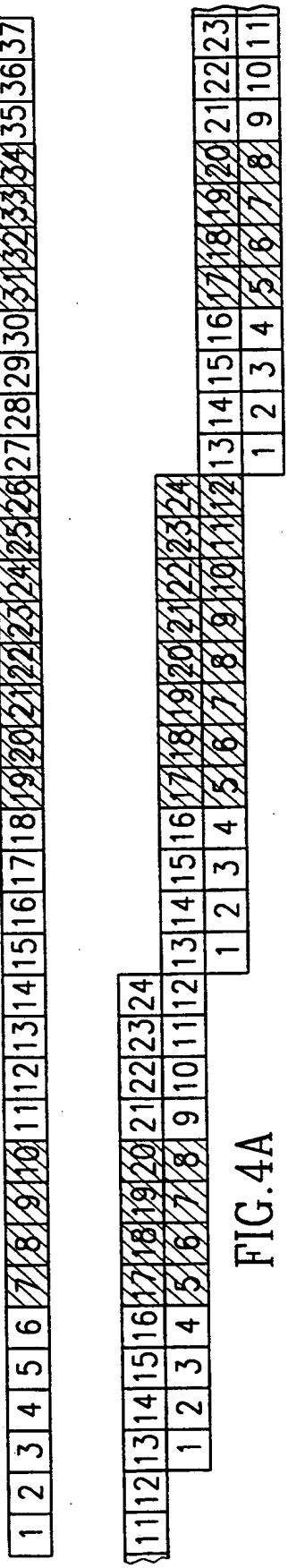

FIG.4A

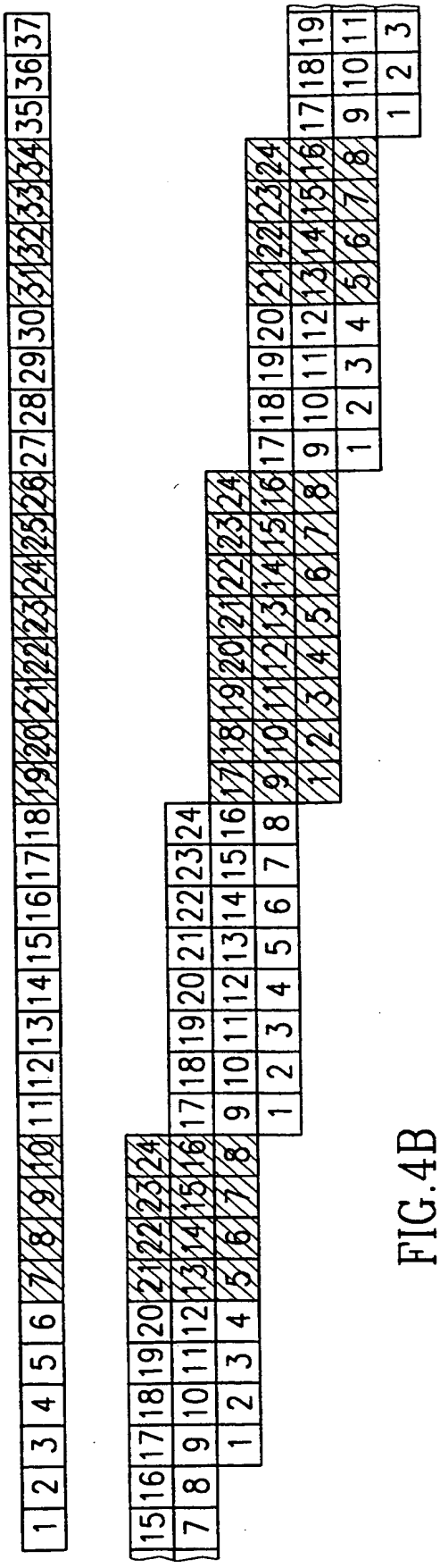

FIG.4B

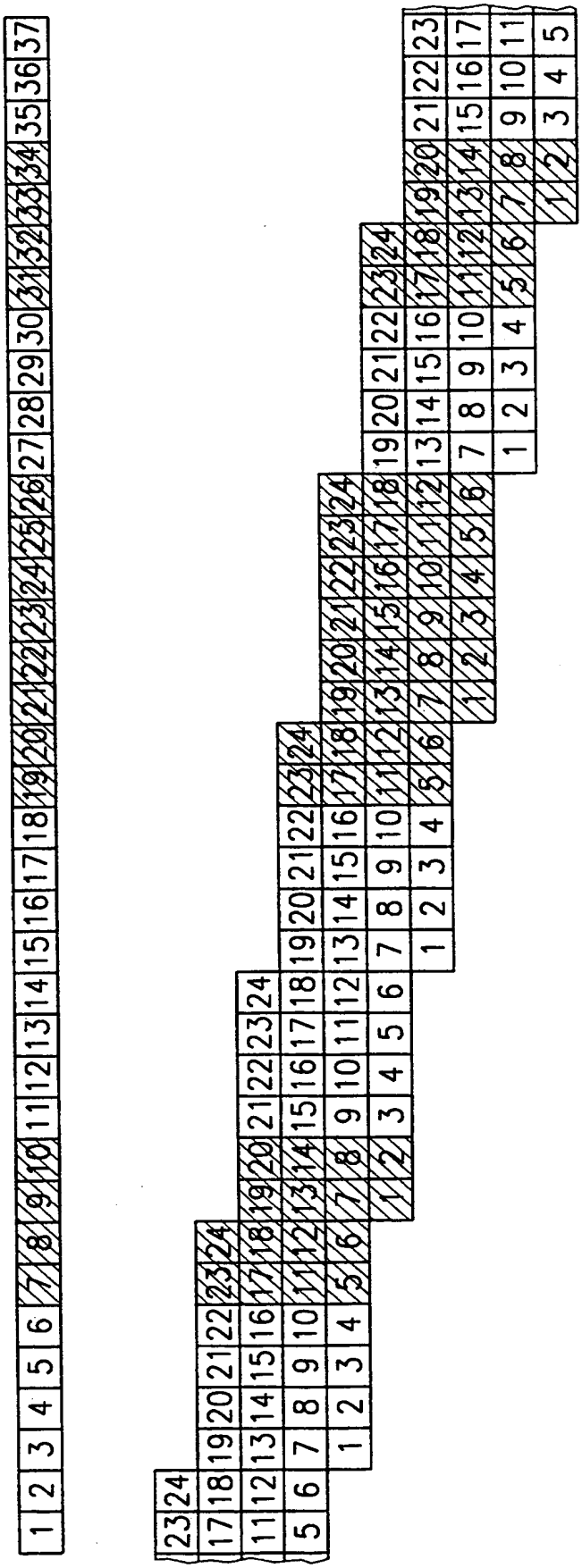

FIG.4C

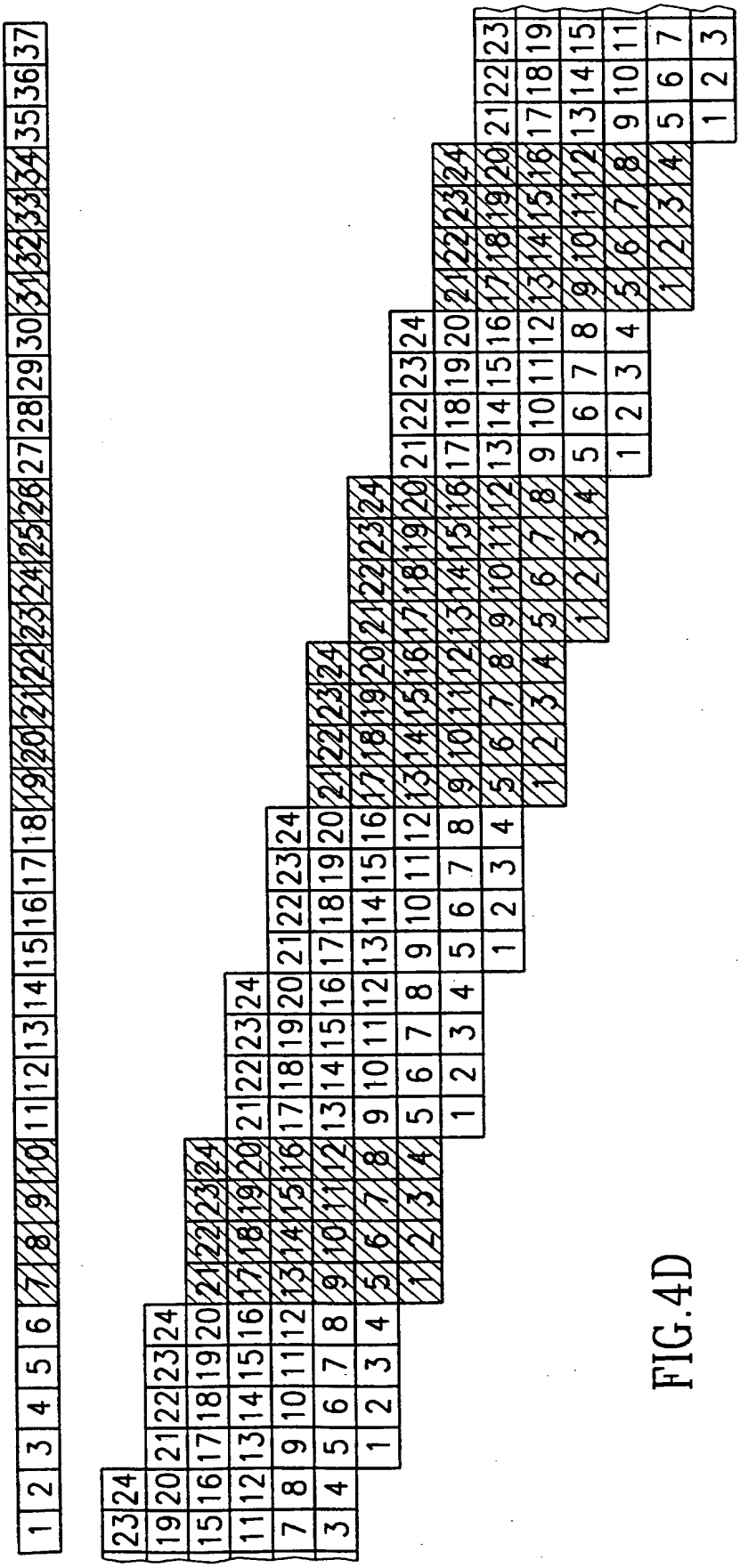

FIG.4D

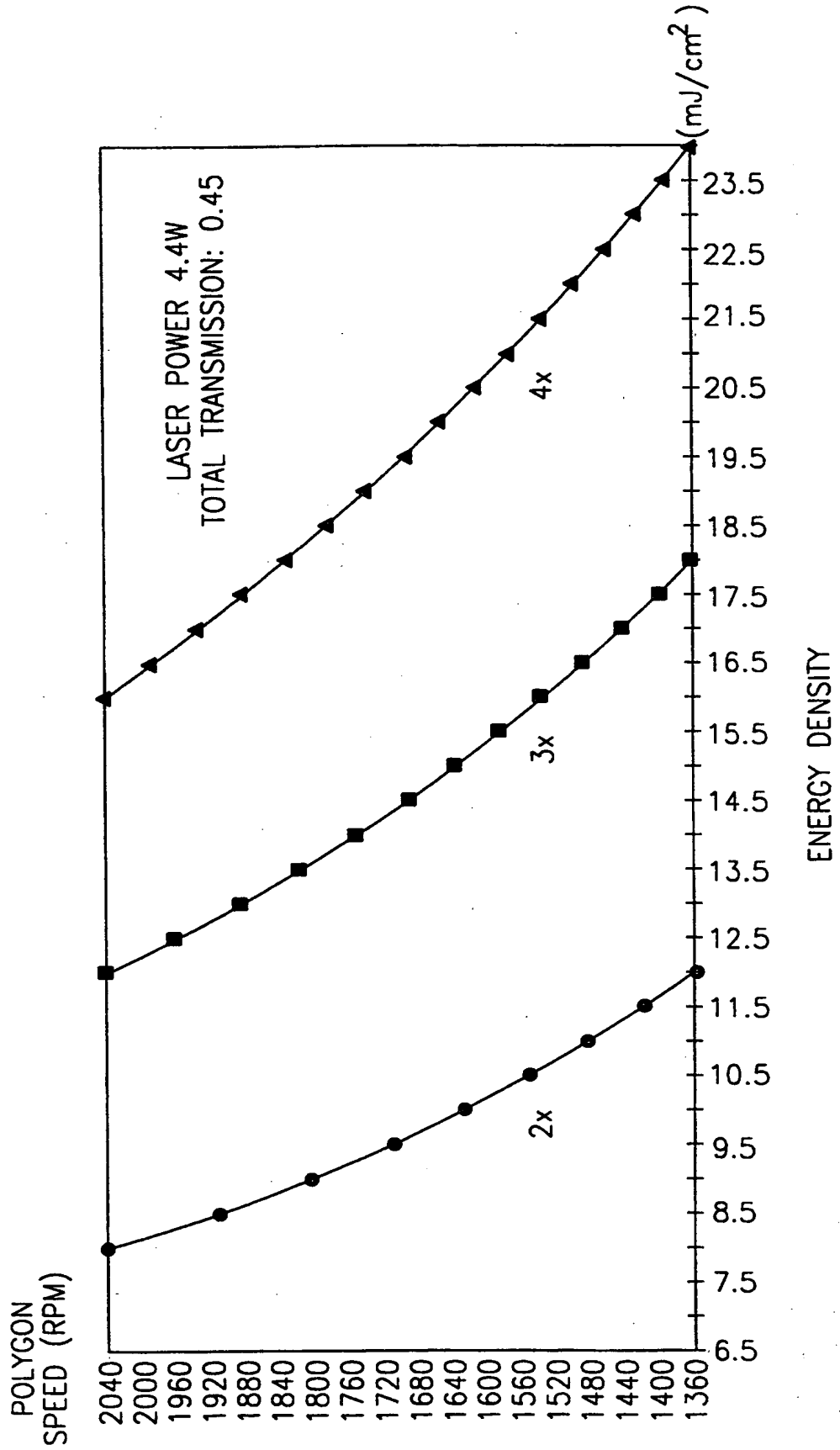
LASER POWER 4.4W
TOTAL TRANSMISSION: 0.45
4x
3x
2x
(mJ/cm²)
ENERGY DENSITY
23.5
22.5
21.5
20.5
19.5
18.5
17.5
16.5
15.5
14.5
13.5
12.5
11.5
10.5
9.5
8.5
7.5
6.5
POLYGON SPEED (RPM)
2040
2000
1960
1920
1880
1840
1800
1760
1720
1680
1640
1600
1560
1520
1480
1440
1400
1360

FIG.5

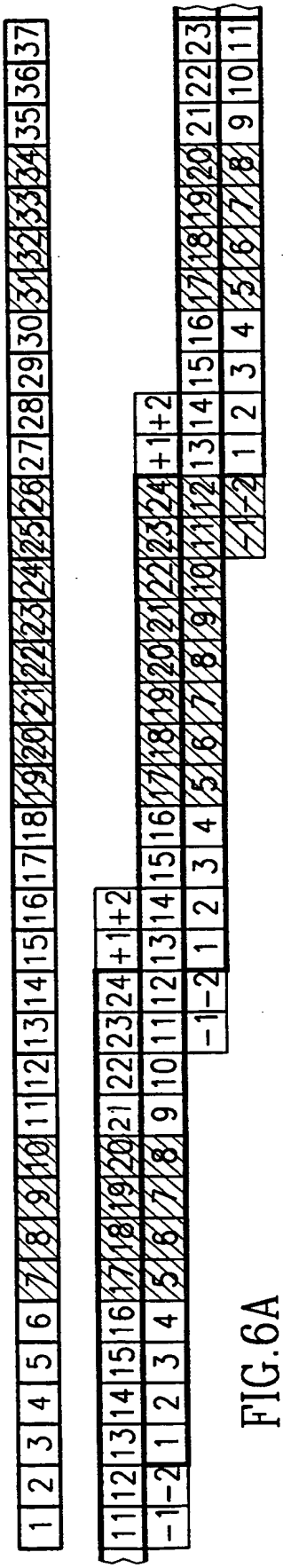

FIG.6A

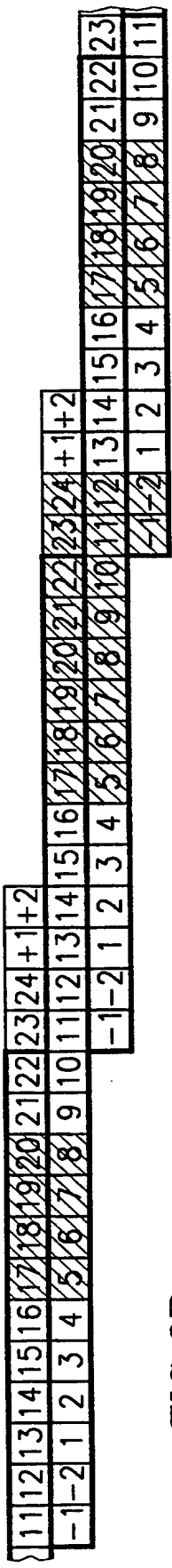

FIG.6B

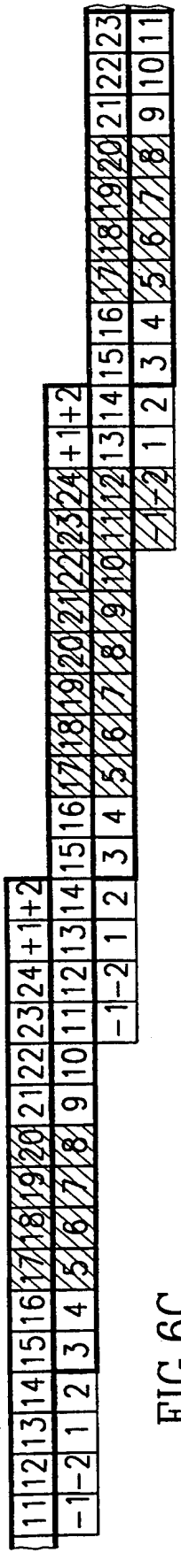

FIG.6C

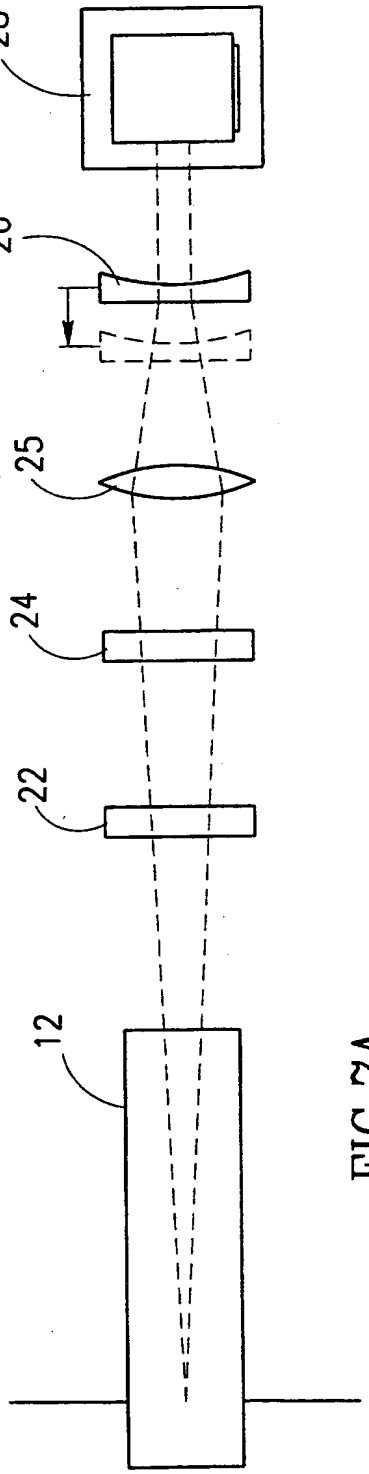

FIG.7A

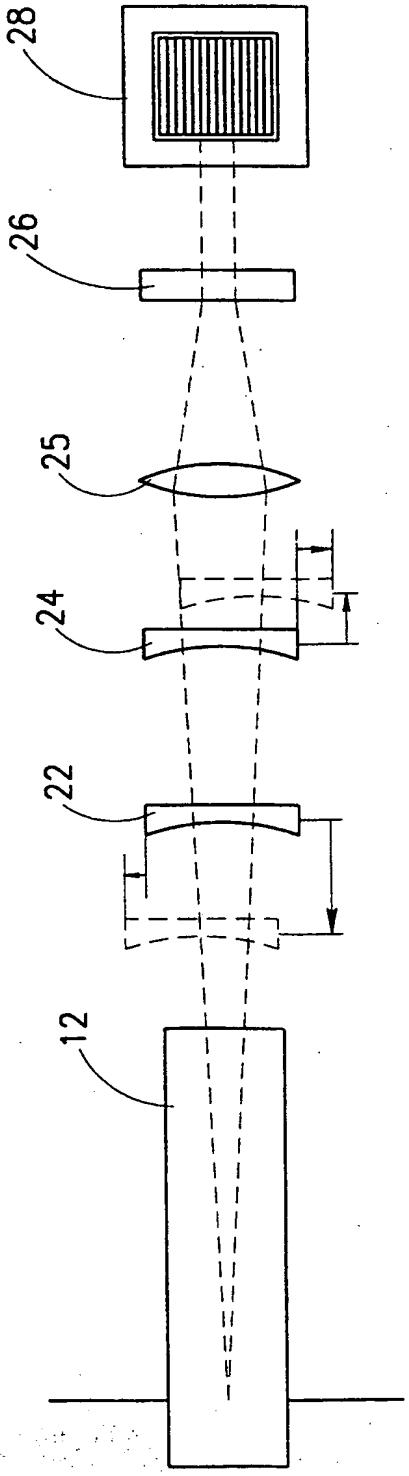

FIG.7B

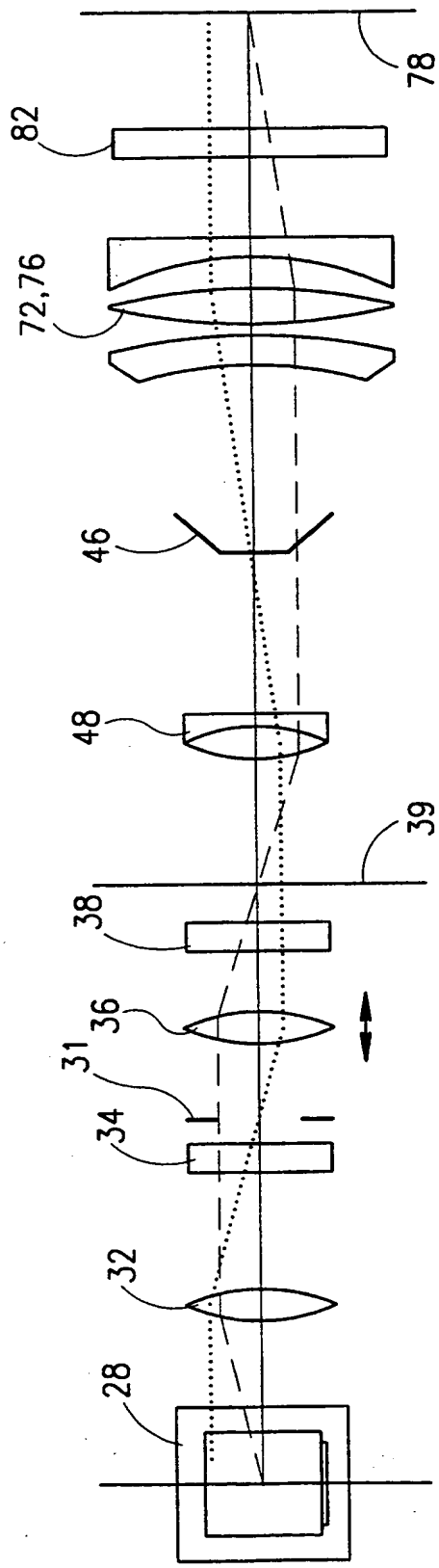
78
82
72,76
46
48
39
38
36
31
34
32
28

FIG.8A

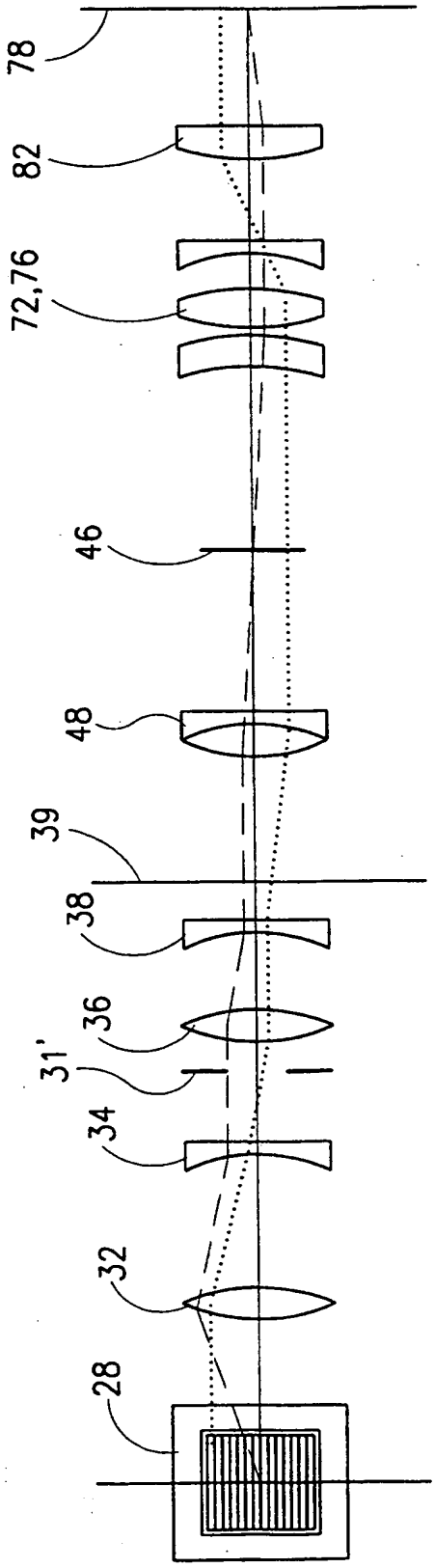
78
82
72,76
46
48
39
38
36
31'
34
32
28

FIG.8B

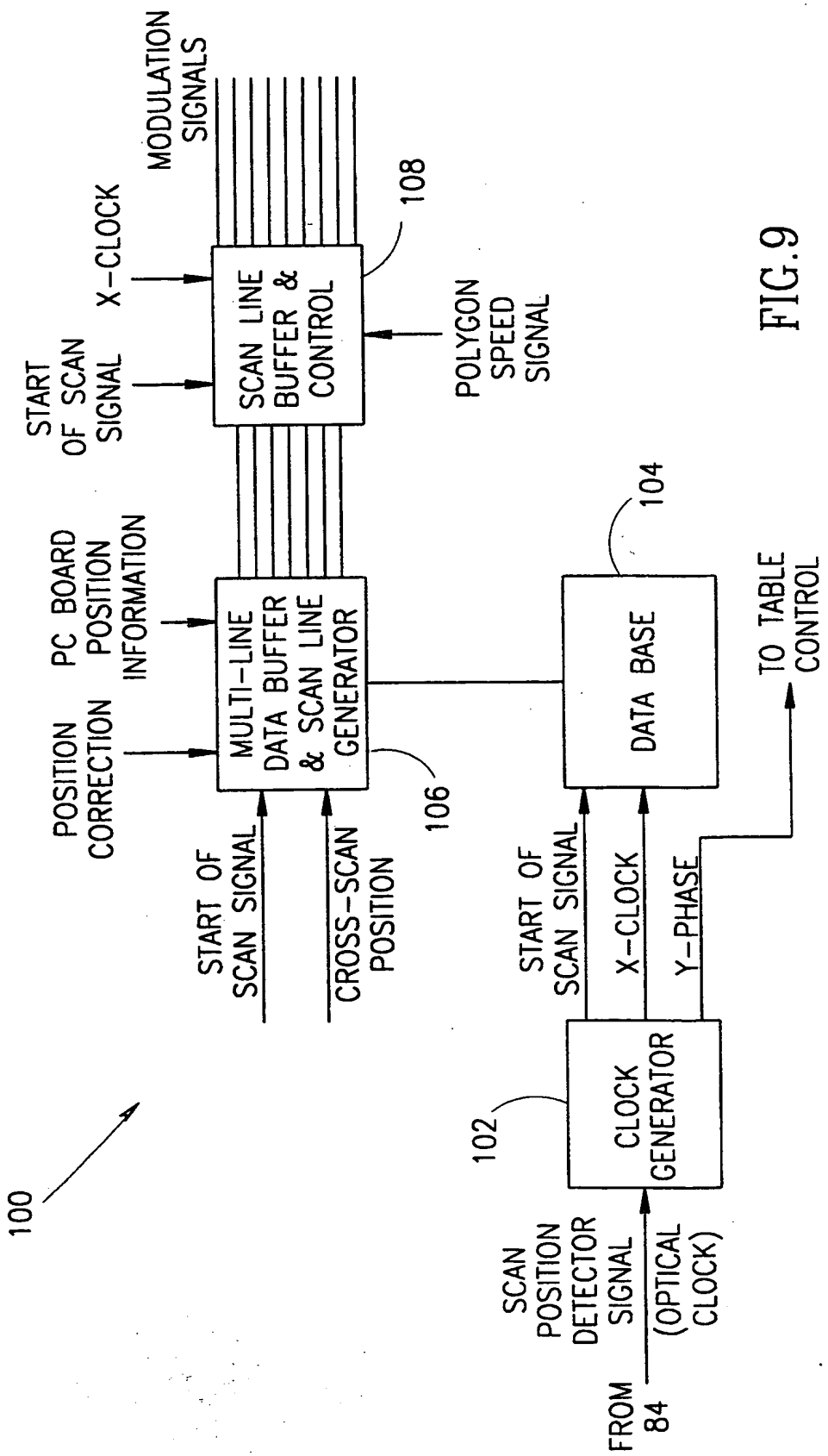
MODULATION SIGNALS
X-CLOCK
START OF SCAN SIGNAL
SCAN LINE BUFFER & CONTROL
108
POLYGON SPEED SIGNAL
PC BOARD POSITION INFORMATION
POSITION CORRECTION
MULTI-LINE DATA BUFFER & SCAN LINE GENERATOR
106
START OF SCAN SIGNAL
CROSS-SCAN POSITION
104
DATA BASE
TO TABLE CONTROL
START OF SCAN SIGNAL
X-CLOCK
Y-PHASE
100
102
CLOCK GENERATOR
SCAN POSITION DETECTOR SIGNAL
(OPTICAL CLOCK)
FROM 84

FIG.9

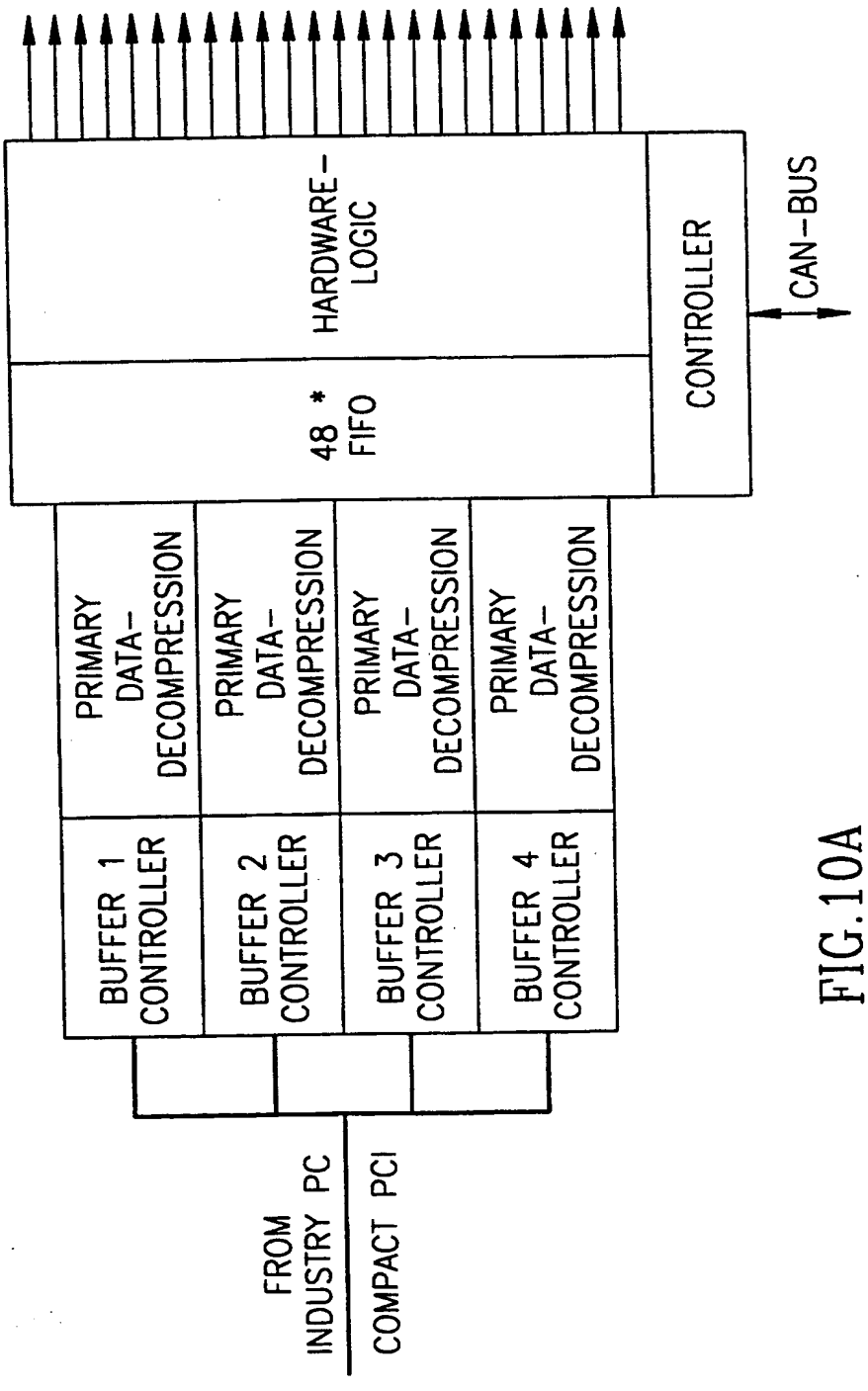
FROM INDUSTRY PC
COMPACT PCI
BUFFER 1 CONTROLLER
BUFFER 2 CONTROLLER
BUFFER 3 CONTROLLER
BUFFER 4 CONTROLLER
PRIMARY DATA-DECOMPRESSION
PRIMARY DATA-DECOMPRESSION
PRIMARY DATA-DECOMPRESSION
PRIMARY DATA-DECOMPRESSION
48 * FIFO
HARDWARE-LOGIC
CONTROLLER
CAN-BUS

FIG.10A

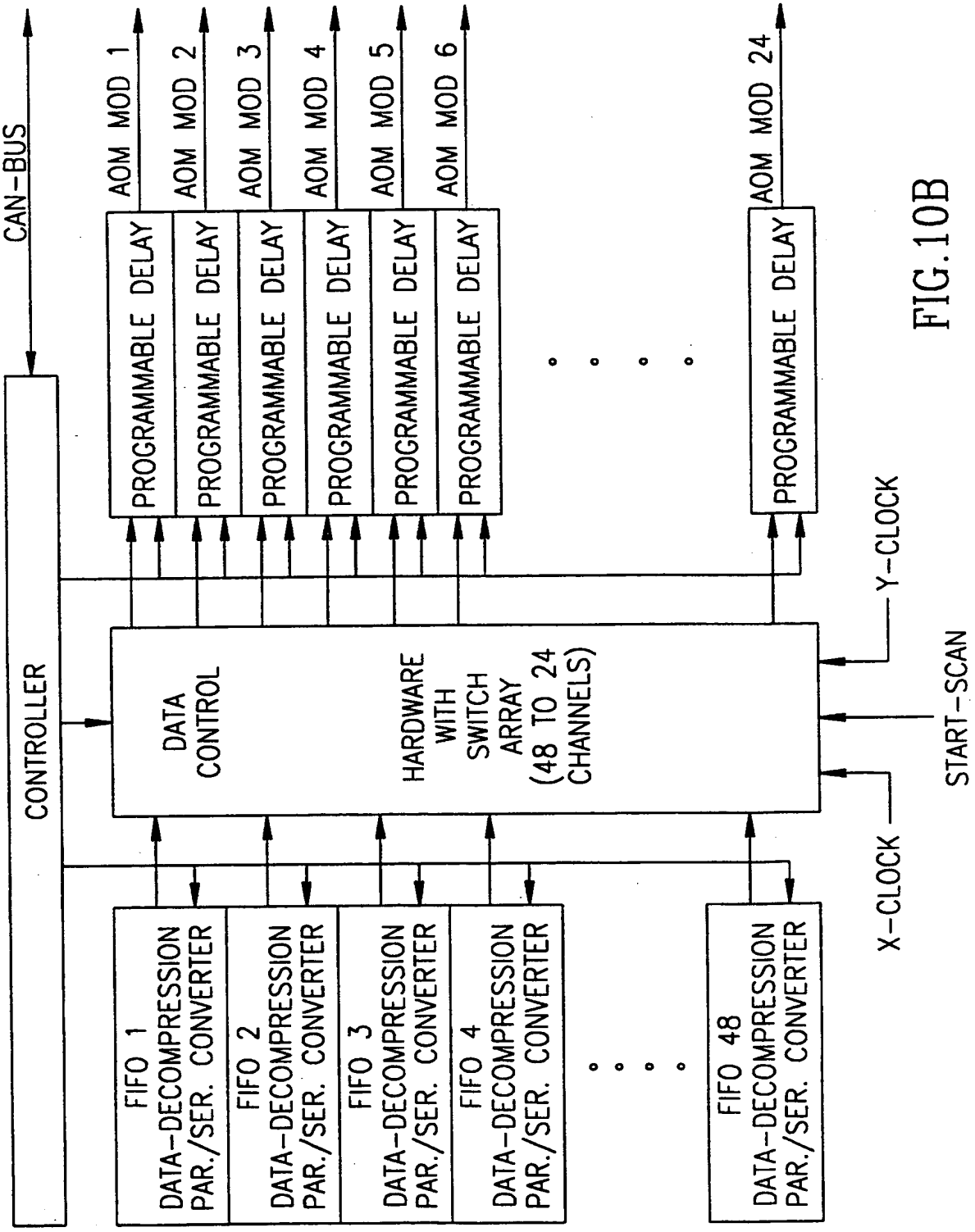
CAN-BUS
CONTROLLER
AOM MOD 1
AOM MOD 2
AOM MOD 3
AOM MOD 4
AOM MOD 5
AOM MOD 6
AOM MOD 24
PROGRAMMABLE DELAY
DATA CONTROL
HARDWARE WITH SWITCH ARRAY (48 TO 24 CHANNELS)
Y-CLOCK
START-SCAN
X-CLOCK
FIFO 1 DATA-DECOMPRESSION PAR./SER. CONVERTER
FIFO 2 DATA-DECOMPRESSION PAR./SER. CONVERTER
FIFO 3 DATA-DECOMPRESSION PAR./SER. CONVERTER
FIFO 4 DATA-DECOMPRESSION PAR./SER. CONVERTER
FIFO 48 DATA-DECOMPRESSION PAR./SER. CONVERTER

FIG.10B

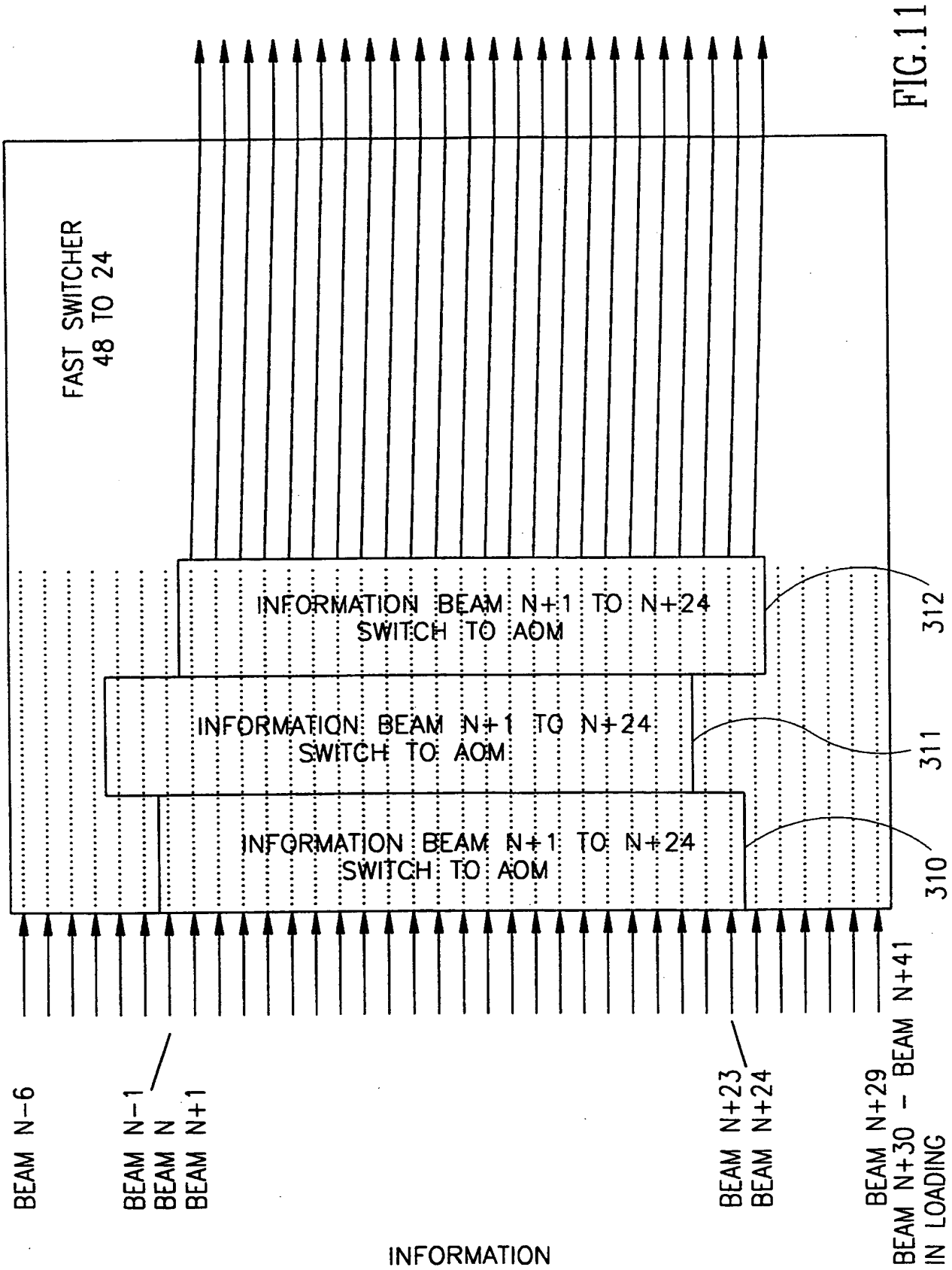
FAST SWITCHER
48 TO 24
INFORMATION BEAM N+1 TO N+24
SWITCH TO AOM
INFORMATION BEAM N+1 TO N+24
SWITCH TO AOM
INFORMATION BEAM N+1 TO N+24
SWITCH TO AOM
312
311
310
BEAM N-6
BEAM N-1
BEAM N
BEAM N+1
BEAM N+23
BEAM N+24
BEAM N+29
BEAM N+30 - BEAM N+41
IN LOADING
INFORMATION

FIG.11

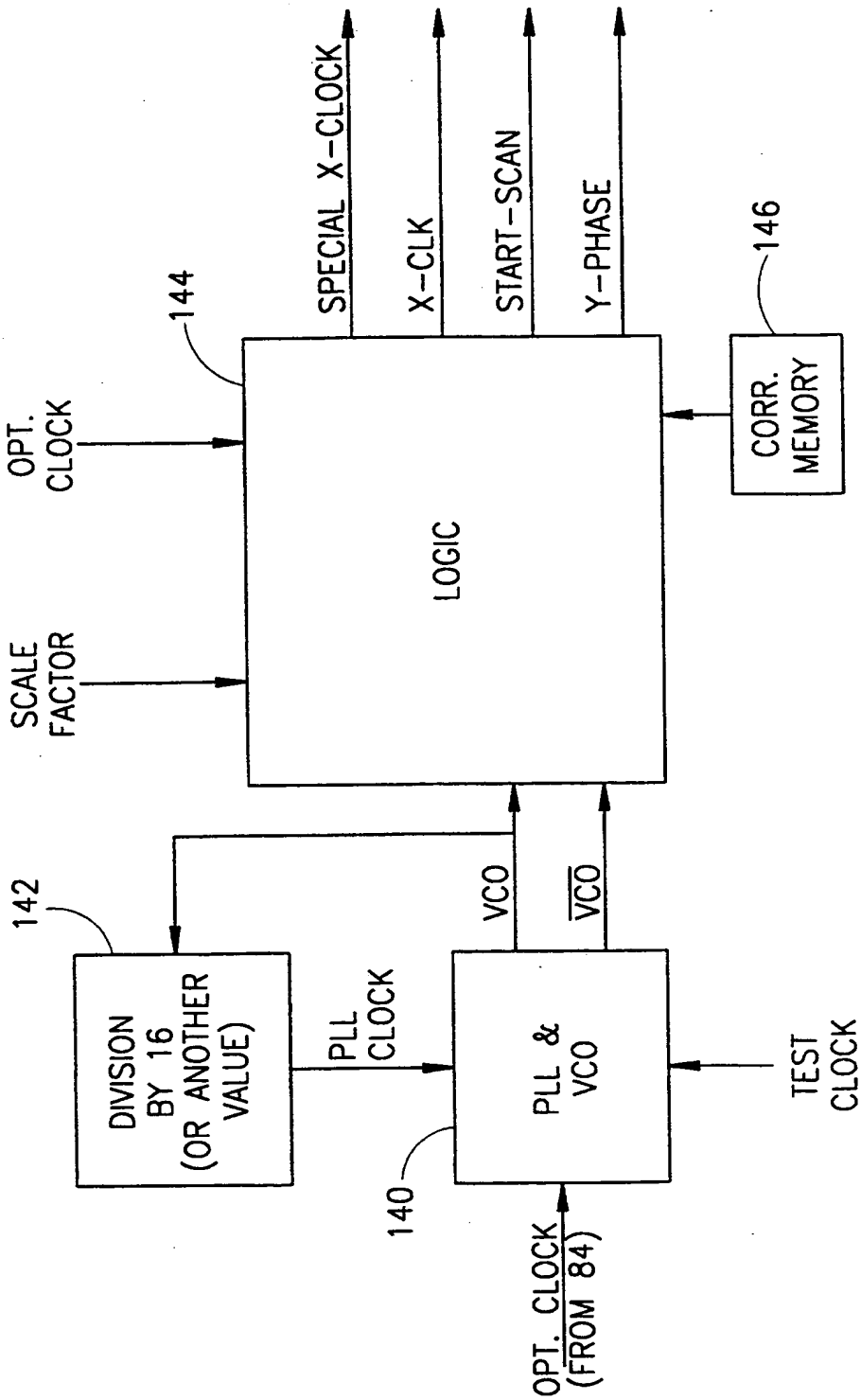
SPECIAL X-CLOCK
X-CLK
START-SCAN
Y-PHASE
144
146
OPT. CLOCK
SCALE FACTOR
LOGIC
CORR. MEMORY
142
VCO
VCO
DIVISION BY 16 (OR ANOTHER VALUE)
PLL CLOCK
PLL & VCO
TEST CLOCK
140
OPT. CLOCK (FROM 84)

FIG.12

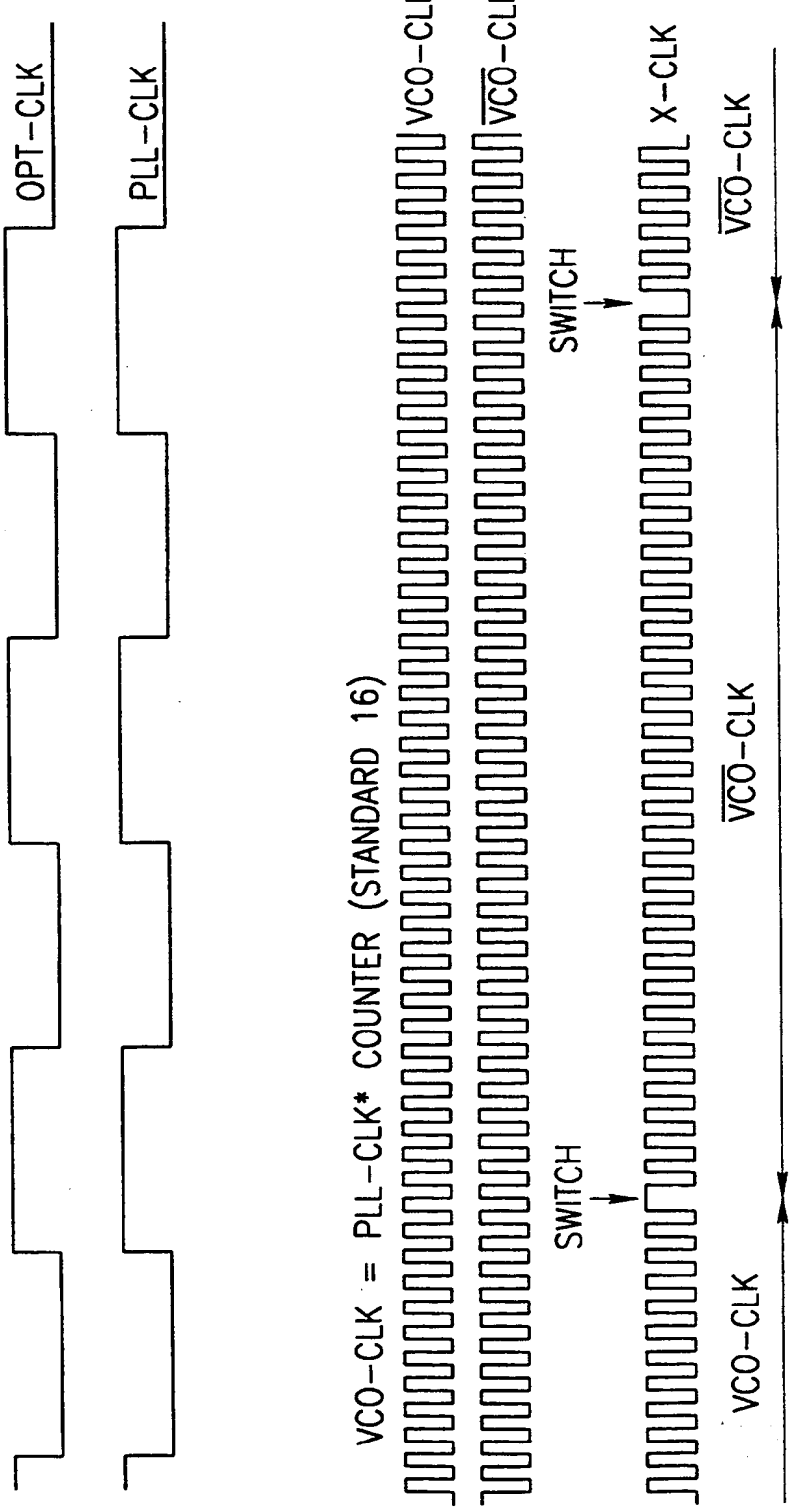
OPT-CLK
PLL-CLK
VCO-CLK = PLL-CLK* COUNTER (STANDARD 16)
VCO-CLK
$\overline{VCO}$-CLK
SWITCH
X-CLK
$\overline{VCO}$-CLK
SWITCH
VCO-CLK
$\overline{VCO}$-CLK

FIG.13

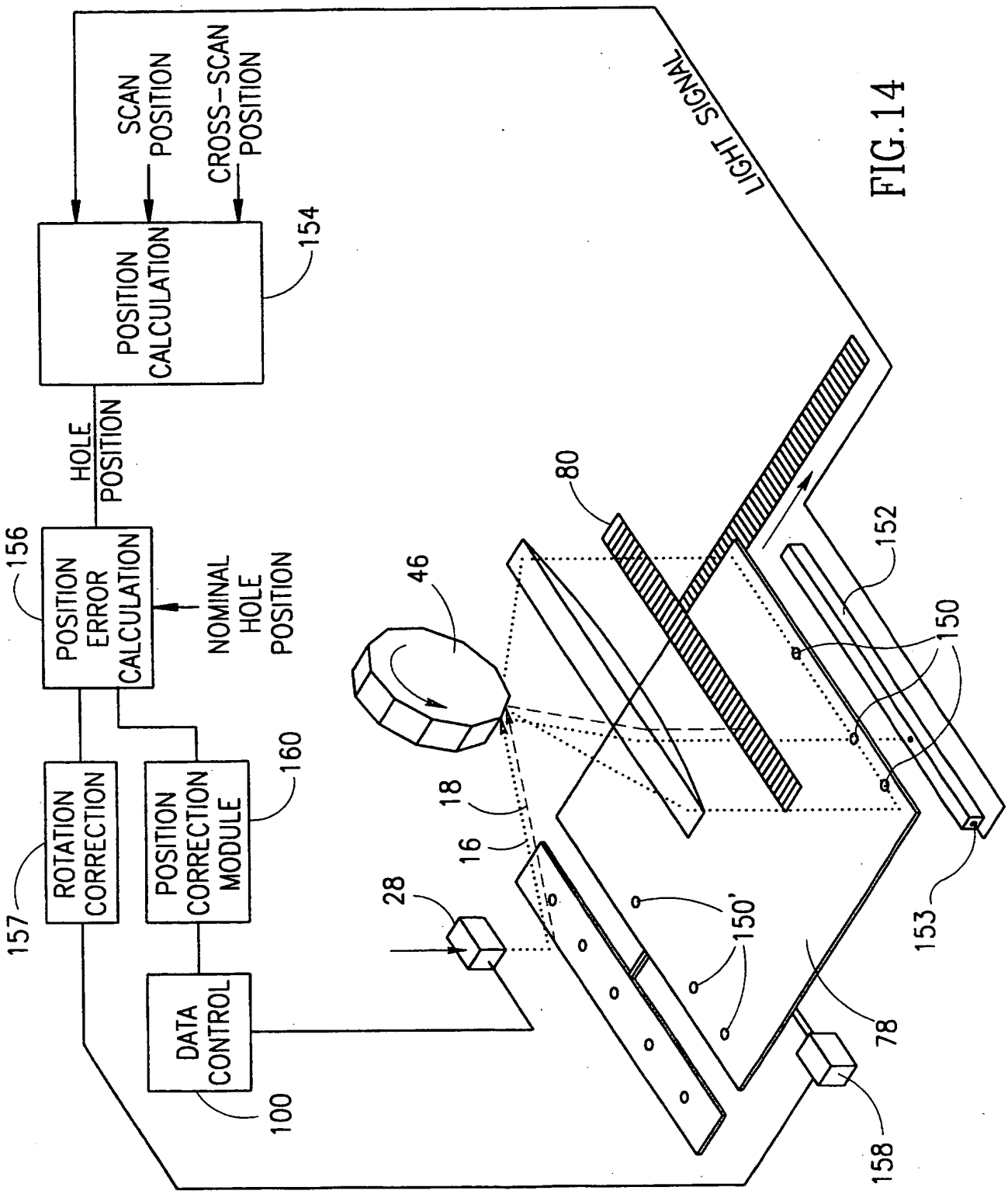
SCAN POSITION
CROSS-SCAN POSITION
POSITION CALCULATION
154
HOLE POSITION
156
POSITION ERROR CALCULATION
NOMINAL HOLE POSITION
ROTATION CORRECTION
157
POSITION CORRECTION MODULE
160
DATA CONTROL
100
LIGHT SIGNAL
80
46
18
16
28
152
150
150'
153
78
158

FIG.14

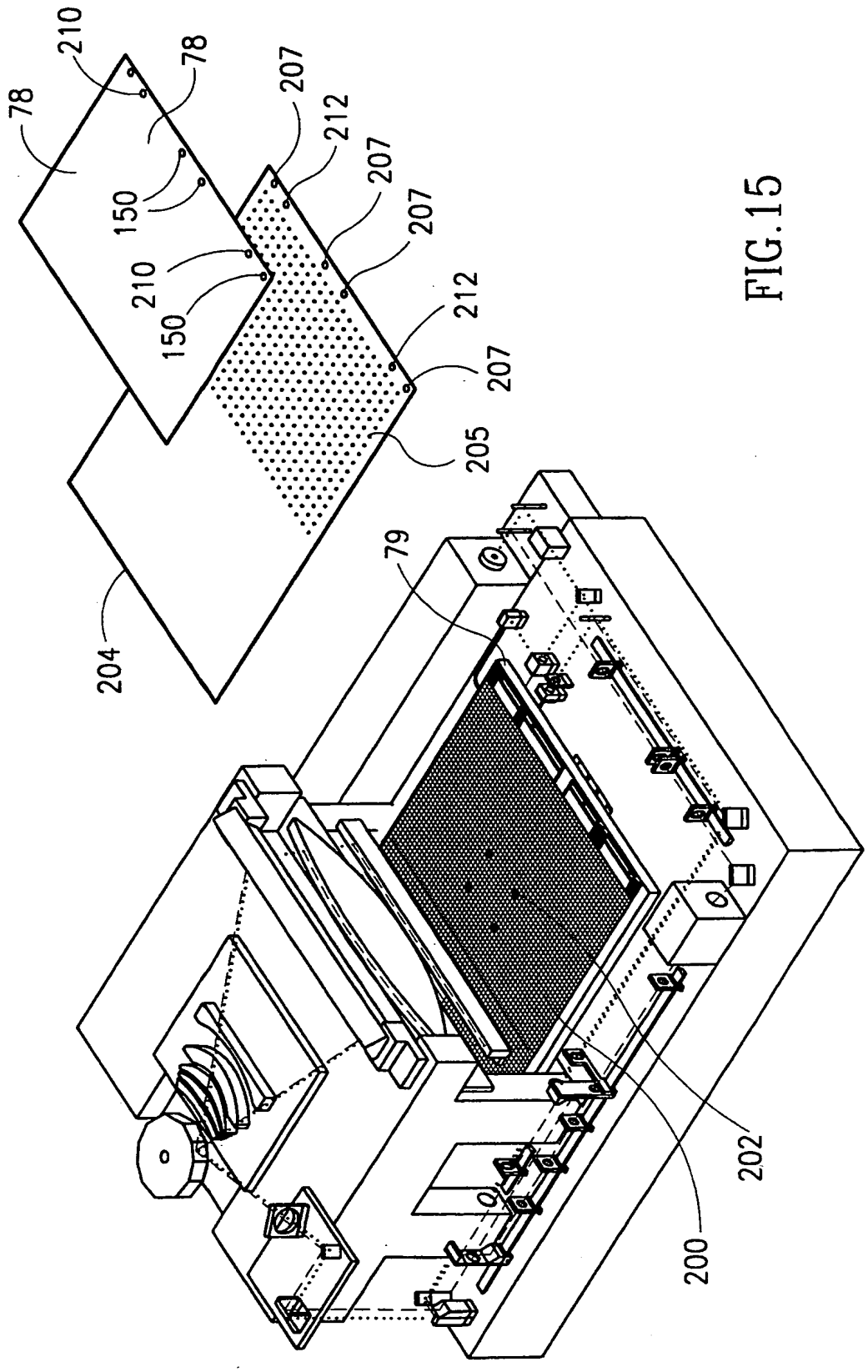

FIG.15

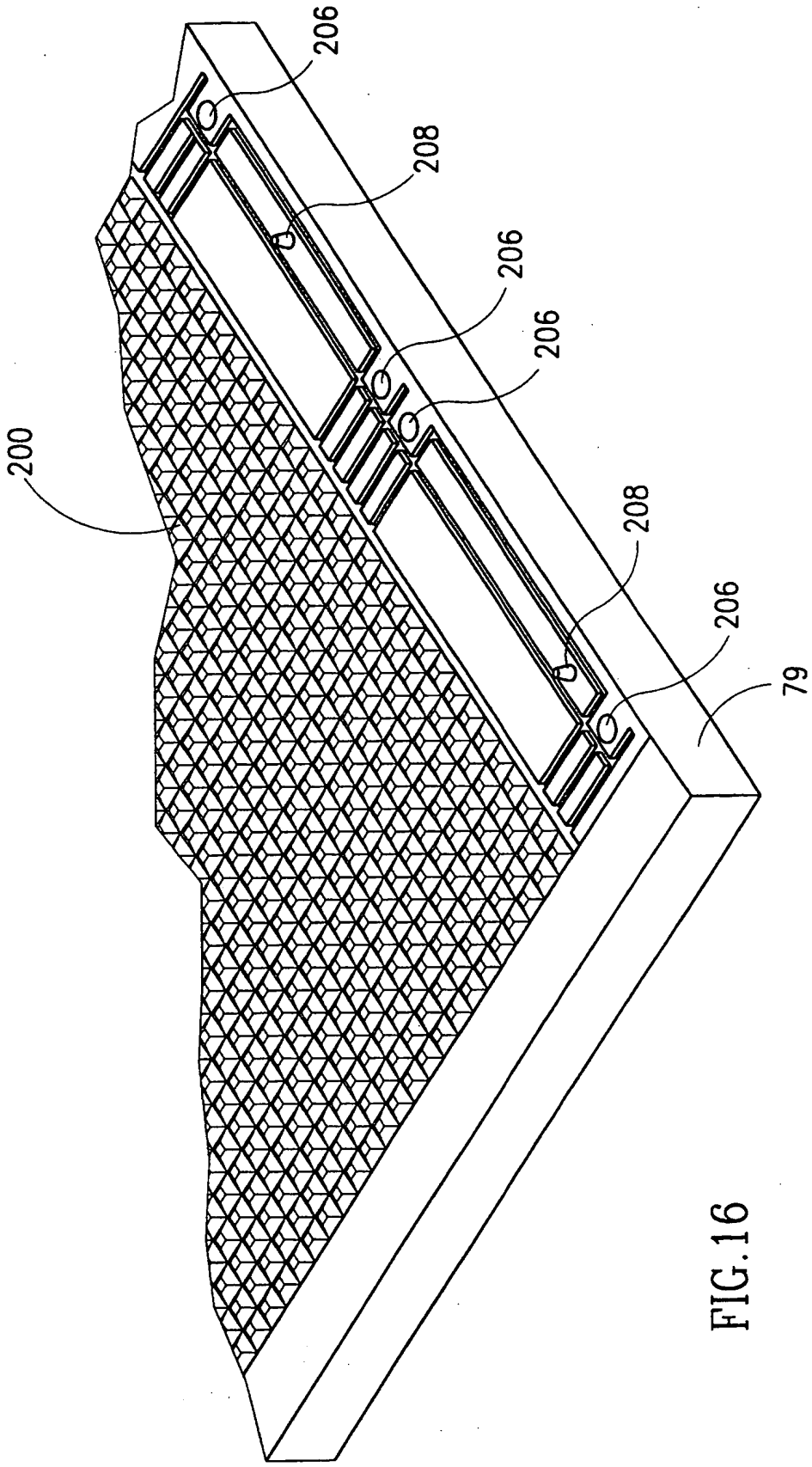

FIG.16

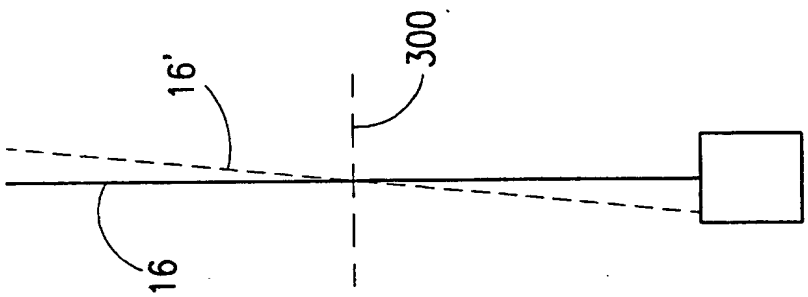

FIG.17A

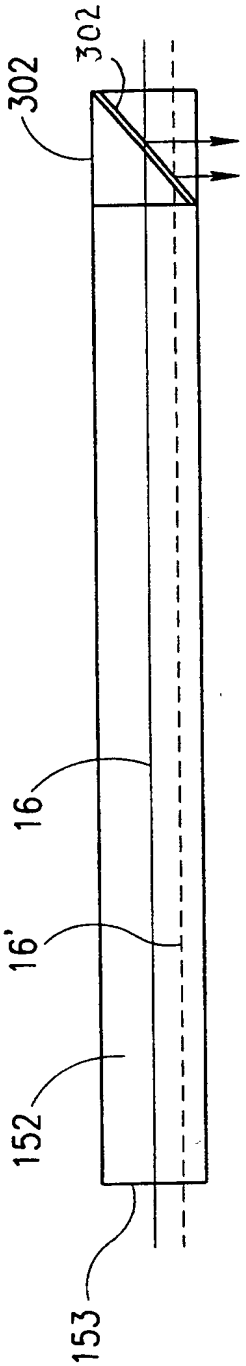

FIG.17B

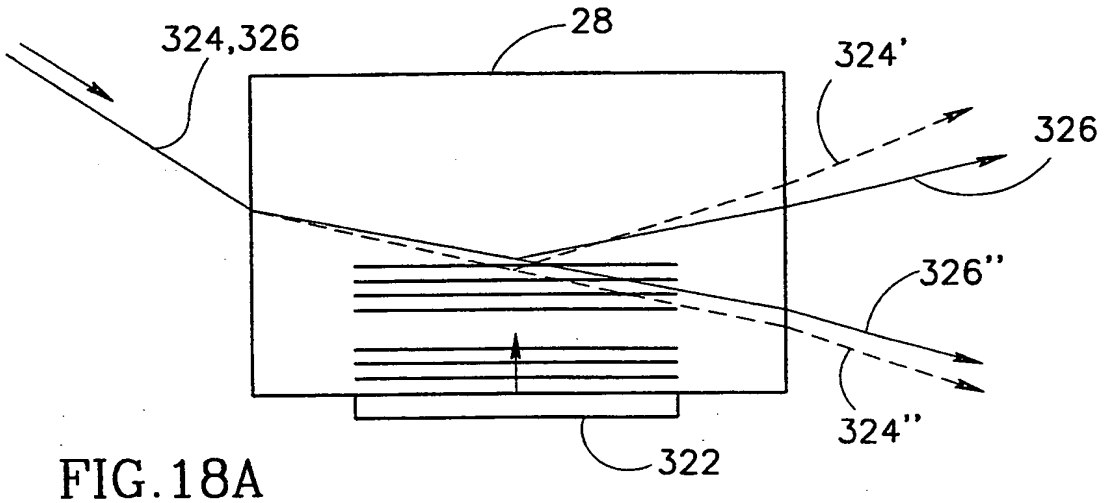

FIG.18A

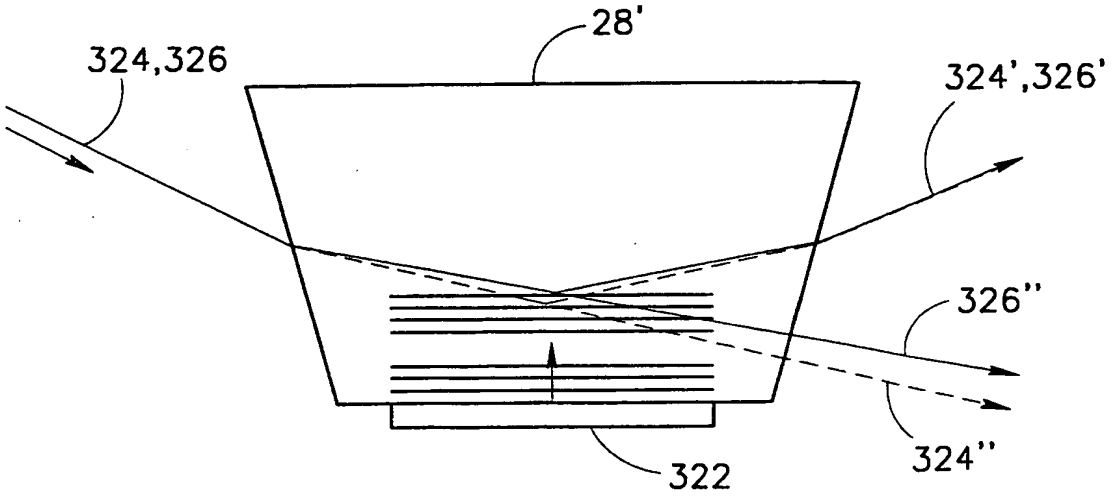

FIG.18B